

## CLAIMS

What is claimed is:

1. An occupant classification system comprising:  
at least one load sensor for determining an amount of load on a vehicle seat; and  
at least one occupant presence detection (OPD) sensor for determining whether the load is animate.
2. The occupant classification system of claim 1 wherein the OPD sensor measures capacitance of the load.
3. The occupant classification system of claim 1 further including a head-tracking system (HTS) for determining a position of a head of an occupant of the vehicle seat.
4. The occupant classification system of claim 3 wherein the HTS determines the position of the head in a horizontal plane, and wherein the occupant classification system calculates a weight of the occupant based upon the position of the head of the occupant as determined by the HTS, the load on the vehicle seat as determined by the at least one sensor and the OPD sensor.
5. The occupant classification system of claim 4 wherein the system determines that a child seat is present on the vehicle seat based upon the at least one load sensor determining the amount of the load on the vehicle seat exceeds an empty seat threshold and based upon the OPD sensor indicating that no occupant is present.
6. The occupant classification system of claim 4 wherein the HTS includes an array of capacitive sensors.

7. The occupant classification system of claim 4 wherein the system compares the position of the head to a position of the vehicle seat to determine an inclination of the occupant.
8. The occupant classification system of claim 7 wherein the system determines the weight of the occupant based upon the inclination of the occupant.
9. The occupant classification system of claim 8 wherein the system further includes a seat back angle sensor, and wherein the system determines the weight of the occupant based upon the angle of the seat back compared to the inclination of the occupant.
10. The occupant classification system of claim 9 wherein the system determines whether the occupant is lying against the seat back based upon the angle of the seat back and based upon the inclination of the occupant.

11. A method for classifying an occupant of a vehicle seat including the steps of:
  - a) determining a load on the vehicle seat; and
  - b) determining whether the load on the vehicle seat is animate or inanimate.
12. The method of claim 11 wherein said step b) further includes the step of measuring a capacitance of the load on the vehicle seat.
13. The method of claim 11 further including the step of:
  - c) determining a weight of an occupant based upon said steps a) and b).
14. The method of claim 13 further including the step of:
  - d) tracking a position of a head of an occupant of the vehicle seat.
15. The method of claim 14 wherein said step c) further includes the step of determining the weight based upon said step d).

16. A method for classifying an occupant of a vehicle seat including the steps of:
- a) measuring a load on the vehicle seat;
  - b) determining a position of a head of an occupant of the vehicle seat; and
  - c) classifying the occupant based upon said steps a) and b).
17. The method of claim 16 further including the step of:
- d) determining whether the occupant is lying against a back of the vehicle seat,
- wherein said step c) further includes the step of classifying the occupant based upon said step d).
18. The method of claim 16 further including the step of:
- determining an angle of inclination of the occupant based upon said step b), said step c) further including the step of classifying the occupant based upon the angle of inclination.
19. The method of claim 18 further including the step of determining a weight of the occupant based upon the angle of inclination.
20. The method of claim 19 further including the step of determining whether the occupant is in a child seat based upon the angle of inclination.